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Upper Cretaceous Calcareous Nannofossil Biostratigraphy and Quaternary Calcareous Nannofossil Assemblages Changes

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博士論文

Upper Cretaceous Calcareous Nannofossil Biostratigraphy and Quaternary Calcareous Nannofossil Assemblages Changes

（上部白亜系石灰質ナンノ化石層序および第四紀ナンノ化石群集解析）

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General Abstract

Calcareous nannofossils are widely used as biostratigraphic markers for age control because of their small size and pelagic nature. These calcareous nannoplanktons are useful for paleoceanographic studies as those inhibit in the photic zone and record surface water conditions such as temperature, nutrient availability and salinity. This dissertation presents results from two important time periods in geologic time scale utilizing both aspects of calcareous nannofossils. The first part show the biostratigraphic framework for the upper Cretaceous successions from the Tethyan realm and the deep sea Atlantic Ocean, and second part deals with the biostratigraphy and paleoceanography during the Quaternary time in Nankai Trough and Bengal Fan. Chapter two presents the calcareous nannofossil biostratigraphy from the Vocontian Basin, south eastern France. Established nannofossil biostratigraphy for the upper Albian to Turonian correlate well with carbon isotope curve and other micro- and macro-fossil stratigraphy and presents integrated bio- and chemo-stratigraphy for the upper Albian to Turonian sections in Vocontian Basin. Chapter three describe the calcareous nannofossil biostratigraphy for the upper Cretaceous sediments from the Site 1407, Integrated Ocean Drilling Program (IODP) Expedition 342 Atlantic Ocean. Thirteen nannofossil zones ranging from UC3 to UC20 were recognized based on identified 61 bioevents between 66 Ma (Maastrichtian) and 96 Ma (Cenomanian). Stage boundaries from Cenomanian to Maastrichtian are recognized except for the Campanian/Maastrichtian boundary at Site 1407.

Chapter four in part II presents the calcareous nannofossil assemblage study for the past 1.8 Myr in the Nankai Trough (IODP 315, Sites C0001 and C0002). Three

recognized nannofossil zones were compared and correlated with oxygen isotope curve. Based on the quantitative calcareous nannofossil assemblage analysis, eight intervals of oligotrophic and eutrophic environments are identified. Paleoproductivity indices (Nannofossil accumulation rates, *N*-ratio, very small reticulofenestrids, and relative abundance of deep photic zone species *F. profunda*) were used to understand the calcareous nannofossil paleoproductivity changes in the Nankai Trough.

Changes in the calcareous nannofossil assemblage and the implication on paleoceanography during the Quaternary time at site U1451, Bengal Fan is represented in chapter five. Six calcareous nannofossil zones were recognized based on identified 18 bioevents. The studied site is generally dominated by deep photic zone species throughout the Quaternary. Seven intervals of varying nannofossil productivity were identified. Global climatic changes such as Mid-Brunhes event and Mid Pleistocene Transition were recognized with the dominance shift within *Gephyrocapsa* species. The paracme interval of medium *Gephyrocapsa* species with increased abundance of small *Gephyrocapsa* and reticulofenestrids marks the Mid Pleistocene Transition. Global increased abundance of *Gephyrocapsa caribbeanica* during Mid Brunhes Event is recognized in Bengal Fan as well. Barren intervals of calcareous nannofossils in the fine sand and silt turbidites in the Bengal Fan are the results of changes in sedimentary fluxes due to the tectonics and climatic changes in the Himalayas and Indian sub-continent.